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Juan Gundlach, 1810-1896.

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Johannes Gundlach

ENTOMOLOGICAL NEWS

AND

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ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

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Juan Gundlach.

By CHARLES T. RAMSDEN, Guantanamo, Cuba.

(Plates VIII and IX.)

Johannes Christopher Gundlach was born on July 17th, 1810, at Marburg, Hesse-Cassel (now Hesse-Nassau), Germany. His father, Johann, a Professor of Mathematics and Physics at the University of Marburg, died, leaving a widow, Christina Redberg, and five children to live on two small pensions, one from the State, and the other from the University, not sufficient to make ends meet and educate the children.

It was from his eldest brother, just returned from Cassel, where he had mastered the art of taxidermy, that Johannes then nine years old, got his first notions in this line; though he had long been fond of studying nature in all its forms, so fond indeed that his spare moments were dedicated entirely to it. On one occasion while collecting birds, being about to shoot one, seeing a guard coming up, Gundlach got so nervous while trying to hide his gun under his coat, muzzle up, the hammer getting fouled in his clothing, the cartridge exploded,

injuring his nose and palate to such an extent that he completely lost all sense of smell and taste. I remember his saying, one day at home, that he had no taste, all things were alike to him, so he ate only to satisfy hunger.

His mother being anxious that he should study for the ministry, he began, but fortunately for science, Dr. Maurice Herold, Professor of Zoology at the University, at the same time offered him the position of Conservator of the University Museum, a chance that was eagerly seized by the young naturalist, who gave up the idea of becoming a Minister of the Gospel, not before obtaining permission from his mother to do so, however. He at once began the course of Zoölogy at the University, where, due to his being the son of one of its Professors, he obtained free tuition, graduating in the fall of 1837 with the degree of Master of Arts, and obtaining that of Doctor of Philosophy the following year.

His ambition was not satisfied with work at the Museum. The wilds appealed strongly to him, so when invited to Surinam, Dutch Guiana, by his friend, Dr. Jules Hille, a Dutch military doctor, who offered him lodging and other help, his joy was unbounded. Communicating his enthusiasm to others, there was formed an organization to furnish funds by the sale of stock to be repaid by Gundlach with specimens collected on the trip. In the meantime he spent half a year studying the Zoölogical Museum at Frankfort-on-Main.

Fortunately for Cuba, about this time Mr. Charles Booth, of Matanzas, Cuba, having finished his studies in Europe, invited Dr. Louis Pfeiffer, afterwards famous for his work on shells, notably his Monographia Helicorum, Pneumonopomorum et Auriculaceorum Viventium; Edouard Otto, son of the Director of the Botanical Gardens at Berlin, and Johann Gundlach, to spend some time with him in Cuba. Gundlach accepted at once with the other two, but with the idea of continuing from Cuba to Surinam. So in November, 1838, they set sail on the brig "Augustus and Julius," arriving on Christmas Day of the same year at Cape Maisi, the easternmost end of Cuba, where contrary winds obliged them to take the course around the southern, or at this season lee side of the Island,

sighting Cape San Antonio on the western end on New Year's Day, making Havana harbor on the evening of the 4th of January, 1839, but not landing till the next morning. They stayed in Havana till the 10th, when they left for Matanzas, there to meet their host, doing so on the 13th at the coffee estate "San Antonio," better known as "El Fundador de Canimar," situated on the right bank of the Canimar River in Matanzas Province. Pfeiffer returned soon to Germany. Otto made a few collecting trips about the Island, then continued to Caracas, Venezuela, while Gundlach remained, but always with the idea of continuing to Surinam, as per his first arrangement. While still in Cuba he was advised of the death of his good friend Dr. Hille, thus cutting off his opportunity to visit Surinam. Gundlach, nothing daunted, wrote his friends in Germany to sell no more stock, that he would repay what he had used with Cuban instead of South American specimens. He at once set to work collecting and shipping material till he had paid all his indebtedness to them, nor did he stop then, but as he used to say that he had no expenses, Booth having taken him into the family, he continued to send specimens to Germany long after he had settled all financial matters at Cassel.

In 1841, Booth moving from "Fundador de Canimar" to the estate "San Juan" near Cardenas City, Gundlach went with him, there widening his range of operations, taking longer trips, and among other things, in March, 1844, he secured his first specimen of the beautiful *Calypte helenae* (Lembeye), dedicating the species to Mrs. Booth, whose name was Helena. And here an example of Gundlach's unselfishness: he turned his notes and description of the species over to Lembeye, who was then writing a book on Cuban Ornithology ("Aves de la Ysla de Cuba," por Juan Lembeye, Habana, 1850, today a rare work), and who thus appears as the author of one of Gundlach's species. This is only one of the almost daily instances of Gundlach's unselfishness; in the same way he has lost many other species in all the branches of Zöölogy. Nor did he know the value of money; he said he needed none, at

least not more than for his bare needs, as clothing, etc. He had free transportation on all trains and coasting steamers; everyone liked him; he interested all with whom he came in contact. He was a most unassuming man, and full of knowledge, which he was willing to impart to any who were interested, but never thrusting it on anyone. It was said of him that he was one of the very few men that no one could censure. Almost childish in his ways, awkward in his movements, simple of dress, he would move from place to place with his "baggage," if "baggage" it might be called, as he did not carry much, but always looked neat. Never perspiring, even on the hottest tropical day, he did not need many changes of clothes, so he travelled "light." Nor was he particular as to where he slept. He told my mother one morning, when she asked him how he passed the night, that he always slept well because he had nothing to worry over; that when he went to bed it was to sleep, having nothing on his mind to bother him, and not even the mosquitoes kept him awake. He had never been in love, so he said, neither did he drink wines nor liquors of any kind, an unusual condition in a German who generally loves his beer; good Havana cigars could not tempt him; he had no palate, but took coffee for its stimulating effect. He was not a heavy eater, nor could he be called a light one. I have seen him start from home early in the morning with nothing but a sandwich in his pocket, and sometimes with but a dry biscuit, returning at night with it uneaten; he had forgotten all about it during the day, his interest being entirely taken in solving one of Nature's problems. Tall and angular of figure, noticeably thin, his kindly blue eyes made friends wherever he passed, while his many years under the sun of the tropics had made his skin dark, unlike the Teuton that he was. He dressed in drill, not of an expensive quality, as I remember it was of a mixed brown and white, or other darkish mixture. He often spoke with affection of his mother, making four trips to Germany to see her.

In 1844 he began his general collection, since become famous, the first specimen of which was a *Calypte helenae* (Lembeye), though he had begun on insects and shells while

living at "Fundador de Canimar" a few years before, keeping odd specimens.

In 1846, at a farm named "El Refugio," near the city of Cárdenas, he established his Museum, open to all who cared to see it, and strange to say there were many who journeyed there, more than 3,000 different persons in four years, a very good record for that time, when one considers the population of the Island, and the inadequate means of transportation. I am sure that today there are not one-third this number of persons in Cuba who have any interest, or even curiosity, to see a collection of Natural History specimens.

In 1849 Gundlach made his first visit to the "Cienaga de Zapata," that large fever-infested swamp, as impenetrable as it is interesting, nearly one-third the size of Matanzas Province, in whose southern border it is located. He went with a letter of recommendation from the Padre Ramón de la Paz y Morejón, a priest-naturalist, stationed at Guamitas, to his relatives at "Hato Zarabanda," on the edge of the "Cienaga," where Gundlach made several visits, stopping with don Pedro Morejón. It was then that he obtained his first specimens of *Ara tricolor* (Bechstein), the Cuban Macaw, then common but now quite extinct, as also his *Agelaius assimilis* (Gundl.) still a very rare bird in collections. While there, he was informed that the Cuban Ivory-billed Woodpecker, *Campephilus bairdii* (Cassin), could be found in the eastern portion of the "Cienaga," so at the beginning of 1850 he went with don Carmen Morejón, to "Hato Cabeza de Toro" on the "Ensenada de Cochinos" on its eastern side, where he had been told there was a specimen of this bird that always carried a long straw in its bill. This bird was shot, and what appeared to observers to be a straw was really an abnormally excessive growth of the upper mandible, which was 12 inches long, curving downward in a semicircle. This specimen may be seen today in the Gundlach collection at Havana, or a picture of it in his work on Cuban Ornithology. One early morning, after he had been up to his waist in the mud of the "Cienaga" since long before daybreak, waiting for a flight of the wary American White-fronted Goose, *Anser albifrons gambelli* (Hart),

he was at last rewarded by bringing one down, but before it could be retrieved there appeared out of the lagoon a crocodile which reached the bird while Gundlach was laboriously wading through the soft mud. Being quite put out by the theft of his specimen, but not having a proper load with which to punish the thief, he determined to return the next day and administer deserved justice. The next morning he was on hand at the same place, and to his great satisfaction saw rise out of the "Cienaga" a crocodile which, to judge from its size, was just the one he was after. Getting read to shoot it, he noticed that two more of the identical size had made their appearance. Gundlach put down his gun in doubt as to which of the three was the culprit, asking them "Which of you stole my goose? Was it you? or you? or perhaps it was you?" The crocodiles remained quite unconcerned swimming about the dark water, and Gundlach, being unable to decide which was the real offender, desisted from his intention, fearing that the innocent might pay for the guilty. During this same year he discovered *Mimus gundlachii gundlachii* (Cabanis) on the Cayo de Santa Maria, opposite San Juan de Terán point to the north of Morón.

Mrs. Booth having died of cholera in 1850, Booth moved to the coffee estate "Arcadia" at "Limonar," Gundlach remaining at "El Refugio." Here, in January, 1851, he met don Simón de Cardenas, a meeting that ripened into a sincere friendship most useful to Gundlach, as he afterwards (in 1855) made his home, and later (1864) moved his museum to the "Fermina" or sugar estate of the Cardenas family, whence many of his most notable specimens came.

In 1852 Gundlach went to Havana, stopping with his friend, the schoolmaster-ornithologist don Juan Lembeye; here he met don Ramón Forns, who later got together the collection of birds, crustaceans, etc., that was purchased in 1876 by the Academy of Natural Sciences of Havana, and forms its collection. He also met for the first time Professor Felipe Poey, the father of Cuban Zoölogy, with whom he had been in correspondence since 1840. This meeting at the house of Poey was as follows: Poey had used frequently in his corre-

spondence with Gundlach the famous phrase of Horace "Animae pars dimidia meae," so when Gundlach entered Poey's home, unexpected and unannounced, he spoke the words "Animae pars....." to which Poey answered ..... dimidia meae," thus completing the phrase and identifying each other. Poey was afflicted with a hemiplegia that incapacitated him for any field work, and only on very few occasions, after overcoming great difficulties by a supreme effort of will power, obeying that irresistible impulse of the naturalist, was he able to have the pleasure of seeing in nature the many forms which he had known only in the laboratory. Gundlach, on the other hand, living close to nature, was able to furnish the specimens from which Poey described many of his species.

In December, 1853, Poey, don Nicolás Gutierrez, then President of the Academy of Sciences of Havana, and don Patricio Paz, chief of the Havana Carabineers, all enthusiastic malacologists, determined upon a trip to the Isle of Pines, to which they invited Gundlach. At the last moment it was found inconvenient for them to go, so Gundlach was sent, the expedition being financed by the other three, the catch to be divided equally among the four. He spent some weeks in the neighborhood of Nueva Gerona, working the Sierra de Casas and Sierra de Caballos, with very good returns, especially in land shells.

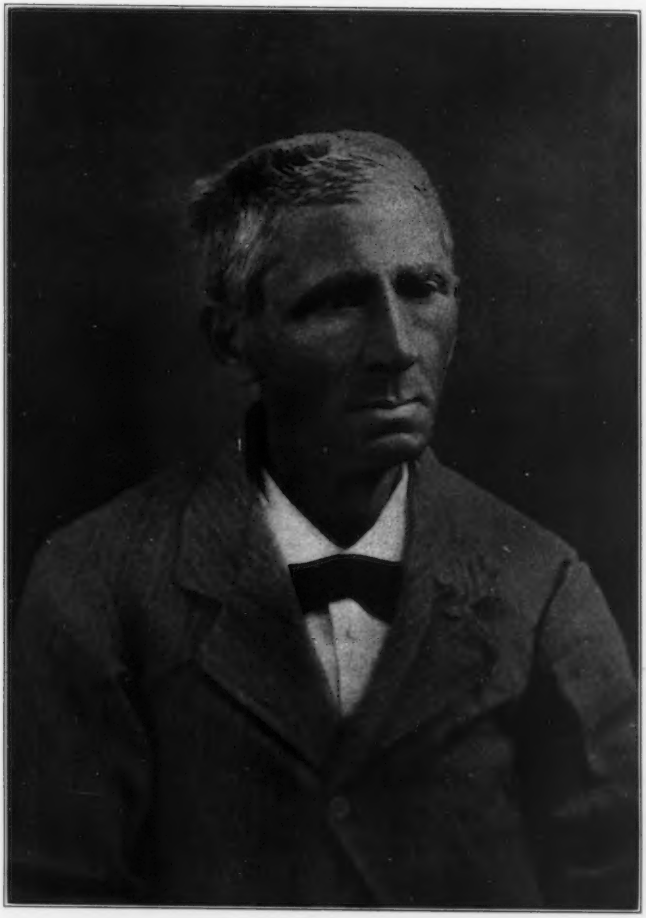
April, 1855, found Gundlach in Pinar del Rio Province visiting the botanist, Dr. Francisco Adolfo Sauvelle, who made it possible for him to continue to the home of don José Blain at "El Retiro,"and to the Sierra de Rangel. In May of this year he discovered among these heights the wonderful *Hymenitis cubana* (H. Sch.), which he at the time thought was *Hymenitis morgane* (Hubn.); also the Cuban Pine Warbler, *Dendroica pityophila pityophila* (Gundl.), and that beautiful variety of *Liguus fasciatus* that Poey named *blainiana* in honor of that generous host of all the naturalists of that day, besides many other interesting forms of the Cuban fauna, which make this range as famous for western Cuba as are the mountains to the north of Guantánamo for the eastern part of

the island; each intensely rich, a paradise for the collector. Gundlach returned from Rangel to Las Posas through San Diego de los Baños and Catalina, exploring on the way the slopes of the Guajaibón range, securing many species new to science, having spent a little over two months on the trip.

It was in June, 1856, under the auspices of Poey, Gutierrez and Paz, with a capital of a little over $200.00 furnished by them, that Gundlach began his first long trip through the Island. Curiously enough when he returned to Havana after over three years he had not spent the entire sum! It was arranged that Gundlach should get all types and uniques, while the duplicates were to be divided equally among the four. He first visited his former haunts in the "Cienaga de Zapata," from which he went to Cienfuegos, then to Trinidad, where he was cordially received by don Justo Germán Cantéro, a rich planter. He explored while hereabouts the "Vigia" of Trinidad, Casilda and "Boca de Guaurabo," as also Juan de Letrán, Magua, Güinia de Soto, Las Lagunas, Aracas, Sitio Quemado and while near Sancti Spiritus, he explored the Sierra de Banao, all with most satisfactory results in new species.

By February, 1857, Gundlach had reached Cape Cruz, Santiago de Cuba (now Oriente) Province where he at once made friends with the pilots that lived there. It was here that he was able to study and collect the Yellow-billed Tropic Bird, *Phaethan americanus* (Grant), examples of which he had seen from the sailing vessel when he had rounded the southern coast of Cuba nineteen years before. He also found here the *Cricosaura typica* (Gundl.), the most interesting species in the reptilian fauna of Cuba. Barbour, in his recent work, "The Zoögeography of the West Indies," Cambridge, 1914, says of this species: "This remarkable archaic monotypic genus has for herpetologists an interest equivalent to that which is held for *Solenodon* among students of mammals. Its excessive rarity.....makes it the most-to-be-desired booty of any naturalist who may collect in Cuba." From here also came the types of *Helix prominula* (Pfr.) and *Liguus poeyana* (Pfr.), the latter remarkable for its sinistral whorls.

Through Manzanillo he went to Bayamo, an interior town



JUAN GUNDLACH.

not far from the foot-hills of the Sierra Maestra range, arriving on June 13th at the Cafetal "Buenavista" of Aguilera, situated on the slopes of the Sierra Maestra. This magnificent range extends all along the southern border of Oriente Province, from Cape Maisi on the east to Cape Cruz on the west, rising, in some instances directly from the sea to a maximum height of some 7,000 feet at "Pico de Turquino,"* a still, zoölogically, unexplored peak, the highest in the island. While staying at "Buenavista" he obtained specimens of that rarest of mammals, the *Solenodon cubanus* (Peters), a female of which served Dr. Peters for his excellent Monograph of the species; this also is the type locality for *Capromys melanurus* (Poey), a rare mammal in collections. In this same range, at a place five miles to the east of the mouth of the harbor of Santiago de Cuba, where the Aguadores river cuts its way between deep cañons to the sea, he shot, in December, 1857, what he considered one of his best prizes, the beautiful *Papilio gundlachianus* (Feld.). I well remember hearing him tell how he procured his first specimen of this butterfly. He was collecting the diminutive *Calypte helenae* (Lembeye), when he noticed this strange butterfly over his head; at once recognizing it as new, but having no net, he shot the specimen with "dust" shot! I could still go to the spot where this specimen was taken, where the Aguadores river, some 600 yards from its mouth, runs through a deep cañon, and here I have waited patiently for the colored beauties to come sailing down from above, stopping for a moment at some flower before going up the opposite side of the cañon. I never saw it come down the river, but always across, down one bank and up the other. It was at this spot that Albert Bonzon, in 1888, discovered its larva feeding on one of the *Aristolochiae*.

Gundlach returned from "Buenavista" to Manzanillo and Cape Cruz in the autumn of this year, then sailed to Santiago de Cuba on a schooner, the skipper of which not only refused to charge him for his passage, but offered to take him free to any place on the coast he might desire, so pleased was he with

*[The "Century Atlas" gives the elevation of Pico de Turquino as 8,400 feet.—Ed.]

Gundlach's personality. Arriving at his destination in December, he stopped with his friend, the Swiss watchmaker, Charles Jeanneret, of malacological fame, who was later, while on a collecting trip, during the Cuban "Ten Years' Revolution," most vilely murdered by the Spaniards, who claimed he was a spy of the insurgents. While at Santiago, Gundlach, accompanied by Jeanneret, made side trips to "Brazo de Cauto," Enramadas (now San Luis), Rincón, La Gran Piedra, and Santa Maria de Sabine, where he found that interesting form of *Pleurodonte* (*Caracolus*) *sagemon* christened *jactata* by Gundlach. He returned for the third time to Cape Cruz in April, 1858.

His first visit to the rich collecting grounds about Guantánamo was in June, 1858, when he lived six weeks at the railway station at Caimanera on Guantánamo Bay, where he collected along its shores. Having found in July, on one of the immense sand flats of that region, a nesting Snowy Plover, *Aegialitis nivosa* (Cassin) with a set of three eggs, he took the mother alive in a bird-net, sending her to Mr. Lawrence, who described it as *Aegialitis tenuirostris* (Law.), but Dr. Ridgway later determined the species to be *A. nivosa* (Cass.). At the mouth of the Guantánamo river, where it empties into the bay, he found the dead and bleached specimens of *Thelidomus emarginata* (Gundl. ms.) that served as types for this species. From Caimanera he went to the town of Guantánamo as the guest of Mr. Theodore Brooks, doing some collecting, then proceeding with don Enrique Lescaille to the latter's cafetal "Ermitaño" on the Yateras range, where the hospitable planters disputed over who should be next honored by having Gundlach as guest. It was on this range that he discovered the type of *Clothilda cubana* (H. Sch.), and also rediscovered that rarest of Cuban butterflies, *Hymenitis cubana* (H. Sch.), the type of which he had taken in 1855 on the ranges in Pinar del Rio Province in the extreme western end of the Island; he was never able to find this species on the mountain ranges of the Central Provinces. Of no less interest was his find of the beautiful *Cydimon poeyi* (Gundl.), whose type he took in February, feeding on the

flowers of the Alligator Pear. Mistaking this species for the *Cydimon boisduvalii* (Guer.) of western Cuba, he did not take many specimens, a fact which he always lamented in after years. He visited, at "San Andrés," the last of the pure-blooded aborigines of Cuba, the Rojas family, a race now extinct. Exploring Monte Toro and Monte Libano, two zoölogically famous ranges, he found in the latter that extraordinary Urocoptid, *Brachypodella brooksiana* (Gundl.), which he named in honor of his first host in Guantánamo. Continuing across toward the north coast of Oriente Province as far as "Santa Catalina," and returning through Guantánamo and Caimanera to Santiago de Cuba early in 1859, he started for Baracoa, the home of that most beautiful of land shells, the *Helix* (*Polymita*) *picta* (Born.) of which nearly 1000 color variations are known, each vying with its neighbor in beauty. Arriving at Baracoa in May of this year, he visited Mata, on the east, there taking the largest of the Cuban land snails, *Helix* (*Polydontes*) *imperator* (Montf.), then very rare in collections, and not now easy to find alive. He climbed that curiously formed height El Yunque, a landmark of all mariners who pass along this portion of the Cuban coast, and on the top took the interesting *Helix* (*Polydontes*) *apollo* (Pfr.). While at Baracoa he captured the type of *Chlosyne perezi* (Gundl.) and visited a curious palm, from the trunk of which protruded ten branches, each with its fronds at the top. In August he began to work his way back toward Havana, along the northern border of the Island passing through Gibára, Nuevitas and Puerto Principe (now Camagüey), arriving at Havana on the 15th of August, 1859, after an absence of a little over three years, well repaid in genera and species for his hardships.

The next four years (1860-1864) he spent in determining and putting in order the material collected, sending specimens to the different specialists of Europe and America. About this time it became fashionable among the wealthy of Havana to adorn their drawing-rooms with Natural History specimens. Gundlach was kept busy furnishing these, and thus became

known to the most influential Havanese of that day, who gave him all the help and encouragement possible.

In 1864, at the repeated invitation of don Simón de Cárdenas, Gundlach decided to move his museum to the sugar estate of "Fermina," of the Cárdenas family, where he could the better attend to it. Here his collections were placed in an upper room of the building used as a hospital for the slaves of the estate.

In 1865 he published his Catalogue of Mammals, Birds and Reptiles, in the "Repertorio Fisico-Natural de la Ysla de Cuba" of Poey. The next year the municipality of Havana commissioned him to take charge of the Cuban zoölogical exhibit at the Paris Exposition of 1867. He personally attended to the packing and shipping of these, as well as of his own, while he followed in February of the next year, being awarded a medal and diploma for his exhibits. The Exposition over, he returned to Cuba in 1868, after visiting friends in Germany, to repair the damage done the specimens, which were not handled lightly *en route*.

The "Ten Years Revolution" having broken out in October, 1868, it became dangerous to do any further collecting in the field. In fact, Gundlach was once taken prisoner by some Spanish soldiers and presented to their captain, who, much to the amazement of his men instead of throwing him into a dungeon to rot, received him with open arms, at once setting him at liberty, and at the same time advising him to give up his excursions on account of the danger, so Gundlach, taking his friend's advice, remained at the "Fermina" estate. Here, since he could not go to the field, he did the next best thing; he brought the field to the estate grounds by planting many vines, shrubs and trees about his quarters, thereby enticing the butterflies, etc., to lay on their larvae's food plants, and thus he collected many rare species without the danger of being arrested, and perhaps shot. He was able to study at ease many larvae that otherwise would have been difficult to examine, and got many of the shiest birds to nest in the trees about his garden. Professor Carlos de la Torre, that eminent Cuban naturalist of to-day, to whom I am greatly indebted for

much information for this article, tells me that in 1882 he saw a pair of humming birds, *Riccordia ricordii ricordii* (Gervais), nesting in an unused chandelier in Gundlach's room at the "Fermina" estate. The birds would fly in at the window, to the table where Gundlach worked, taking bits of cotton and tow to build their nest, such was his gentleness.

Since 1866 Gundlach had been invited by the Jesuit priests at San Juan, Porto Rico, to form a collection for their school in that city, but his attendance at the Paris Exposition obliged him to decline. He was again invited in 1870, this time by the then German Vice-Consul at Mayagüez, Herr Leopold Krug, who shortly after left for Berlin, so Gundlach did not decide to visit the Island till 1873, when, seeing that the revolution in Cuba was not waning, he embarked at Havana on the 4th of June of that year on the steamer "Manuela" for Mayagüez, where he got in contact with the amateur naturalists of the Island, such as Dr. Domingo Bello Espinosa (botanist), of Mayagüez; Mr. Halmarson (ornithologist), of Arecibo, and, on his second trip, with Dr. Agustin Stahl of Bayamón, well known to all who have worked Porto Rico zoölogically. It was Dr. Bello Espinosa who, in 1871, first discovered that the genus *Eleutherodactylus* (*Hylodes*) did not undergo all the transformations usual with the frogs, and Gundlach, in 1881, made further research on this same subject, sending his results to Dr. Peters, of Berlin, who then described and figured eggs and embryos of the *Eleutherodactylus martinicensis* (Tschudi). Gundlach remained in Porto Rico for six months, working over Aguadilla, Guánica, Lares, and Utuado in the interior, as also Arecibo on the north coast and Quebradillas, returning to Havana, where he arrived on December 4th, 1873.

His second Porto Rican trip was begun on the 4th of September, 1875, when he embarked on the steamer "Marsella." His work on this occasion was for the most part about Vega Baja, and Bayamón, where he was the guest of Dr. Stahl. Returning, he arrived at Havana on the 25th of August, 1876, making a third trip in 1881, remaining there for some time.

Alternating with these trips he worked on the publication of his writings on Cuba and Porto Rico. The former were

published in the "Anales de la Academia de Ciencias de la Habana" and the latter in the "Anales de la Sociedad Española de Historia Natural de Madrid," at the same time being published in Germany (see bibliography). This work he kept up till the last days of his life.

In 1882, Dr. Carlos de la Torre, then Curator of the Museum of the Institute of Havana, indicated to Dr. Fernando Reynoso, its Director, the necessity of forming a collection of Cuban examples, proposing Dr. Gundlach as the best man for so doing. A trip to the "Fermina" estate was arranged, where they spent a very pleasant week with Dr. Gundlach and the Diago-Cárdenas family. Reynoso, very much pleased with what he saw, proposed that Gundlach should move to Havana, but this the latter would not listen to, as he had become almost indispensable to the Cárdenas for whom he had the highest esteem, and to whom he was most grateful for the many kindnesses received from don Simón long before. Reynoso, though not a naturalist himself, took great interest in all who were so inclined, protecting them in any way possible, and did so now to Gundlach by ordering from him specimens for the proposed Cuban collection at the Institute, while at the same time cherishing the hope of being able to purchase Gundlach's entire collection. Through Reynoso's desire to help him, Gundlach made trips to eastern Cuba in 1884 and the spring of 1885, again in 1887 and 1888, in the interest and for the account of the Havana Institute. These trips were made to places already visited, with the object of securing additional examples of rare local species. After 1888 Gundlach made no more explorations, occupying himself in moving his collection to Havana and into the Institute, by putting in order the general collection already there, as also other smaller collections. He, however, continued to publish his observations till 1893, when he published his last large work, "Ornitologia Cubana," edited by Dr. Enrique Lopez, of the Policlinica. In 1894 he wrote three articles in the Annals of the Institute of Havana (see bibliography).

Meanwhile, the financial situation of Gundlach's adopted family was going from bad to worse, as was generally the case

with the families of that day; the "Fermina" was abandoned as a sugar estate, and let out as a pasture, which in time was lost; so Gundlach had no reason for longer remaining on the place. Dr. Reynoso, who had never lost hopes of acquiring the collection, and because of the friendship he had for Gundlach, renewed his offer of purchase. Gundlach, who under no other circumstances would have parted with his treasure, saw in Reynoso's proposition the fulfillment of his desires—that the collection should remain as a whole and not be removed from the Island he had learned to love, and that he would be able to aid the Cárdenas family with the price thereof, and thus materially show his gratitude to them for the many kindnesses received from their ancestor. He accepted the offer, and after the usual amount of red tape attached to all official business in Spanish-American countries, the authorities sanctioned the purchase, at the price of $8,000.00 Spanish gold, a price much below the real value of a collection that contained so many types, cotypes and uniques. Reynoso, however, partially made up for this by purchasing other specimens, and helping Gundlach in other ways, while the tedious "red taping" was in progress, commissioning him to prepare the place where the collection was to be housed, and lastly by naming him curator for life of the same at a salary of $100.00 Spanish, a month, which amounts, as well as any and all others that he received, were handed over to Mrs. Cecilia de Cárdenas de Diago, the daughter of his protector, who now in turn was in need of being protected.

Finally, in May, 1892, authorized by a royal decree at Madrid, under date of April 8th, the deed of sale by Gundlach to the Institute was signed, and he received the $8,000.00 Spanish gold, upon which he went directly to Mrs. Cárdenas de Diago, placing in her hands the entire amount, saying: "This does not belong to me; it is yours; I leave it with you knowing full well that you will employ it with the same high purpose and generosity that you have granted this humble servant of science, and who feels eternally united to you and yours by the most sincere bonds of gratitude and love." Thus

did Gundlach show his gratitude to the children of his benefactor.

The collection was completely installed in its new quarters by the middle of 1895, and on the 17th of July of this year, Gundlach celebrated at the Museum his eighty-fifth birthday, a very happy man, his ambitions achieved, surrounded by his many friends, among whom were the Cárdenas, who were present to see once more the collection they had lost sight of for eleven long years. Unfortunately he was to enjoy this satisfaction but a short time. An attack of grippe developing into broncho-pneumonia hastened the end. He nevertheless continued attending to his daily duties at the Museum till approximately a month before his death, when upon getting out of a car on his way home, he fell in a syncope, having to be carried in a chair to his house at (old) No. 51 5th Street, corner of "G," Vedado, Habana, which he did not again leave alive. He slowly weakened, though most tenderly nursed through this, his last illness, by Mrs. Cecilia de Cárdenas. It was she who gave him his last glass of milk after drinking which he turned over and quietly fell asleep never to awake. Thus passed away, on the 17th of March, 1896, the dreams of his life realized, one of the noblest men the world has known.

There is not much more to be said. The collection is today as he left it in its mahogany and glass cases in the specially built department over the Library of the Institute. The fronts of the cases are screwed, and only opened from time to time for cleaning. The room is kept closed, but the collection may be seen by special appointment by any who may be interested. A few of the smaller specimens have deteriorated and some have disappeared, otherwise they are in good condition. Its present curator is Dr. Pedro Valdés y Raguéz. Gundlach's library is also at the Institute, but Dr. Carlos de la Torre has his entomological and malacological note books, while Dr. Torralbas has an unedited work of Gundlach's on the Crustaceans of Cuba.

List of Honorary Memberships Accorded Gundlach.

1851, April 5th. Honorary Member of the Boston Society of Natural History.

1853, Jan. 31st. Corresponding Member of the Natural History Society of Montreal.

1853, May 13th. Corresponding Member of the Society of Natural History of Waterau.

1861, May 26th. Socio de Merito, of the Academy of Sciences of Havana.

1864, Jan. 11th. Corresponding Member of the Entomological Society of Philadelphia.

1864, July 19th. Honorary Member of the Naturalists Society of Boston.

1865, Mar. 28th. Member of the Department of Sciences of the Lyceum of Matanzas, Cuba.

1865, May 24th. Socio de Merito of the Sociedad Económica de Amigos del Pais de la Habana.

1867, June 25th. Corresponding Member of the Academy of Natural Sciences of Philadelphia.

1872, Dec. 5th. Member of the Sociedad Española de Historia Natural de Madrid.

1878, Aug. 23rd. Socio de Merito of the Círculo de Hacendados de la Habana.

1883, July 10th. Corresponding Member of the Museo de Historia Natural de Madrid.

1883, Sept. 28th. Honorary Fellow of the American Ornithologists' Union.

1885, Oct. 6th. Honorary Member of the Brooklyn Entomological Society.

1886, (first half) Honorary Member of the Entomological Society of Berlin.

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[The portrait of Gundlach reproduced on Plate VIII is from a photograph which has long been in the collection of the American Entomological Society. It may have been received not long after Gundlach's election as a corresponding member of the Entomological Society of Philadelphia (Jan. 11, 1864). The portrait on Plate IX is from a photograph, dated on the back February, 1885, and forming a part of Prof. P. R. Uhler's collection, presented by Mrs. Uhler to the American Entomological Society in 1914. The fac-simile of Gundlach's autograph on Plate VIII is from a letter to Mr. E. T. Cresson in May, 1866. It will be noted that the first name is there written "Johannes." On the title pages of the Entomologia Cubana, the author's name is spelled "Juan Gundlach."—ED.]

Additions to Insects of New Jersey, No. 2 (Lep.).

By HARRY B. WEISS, New Brunswick, N. J.

With a few exceptions, the records for this list were received through the kindness of Mr. Otto Buchholz, of Elizabeth, N. J. Mr. Buchholz also gives the following food plants for species in the 1909 list, where food plants were lacking. *Nonagria laeta* Morr., larvae in *Sparganium*, Bird; *Achatodes zeae* Harris, larvae in young alder shoots; *Apamea velata* Wlk., larvae in *Carex stricta; Catocala similis* Edw., larvae on scrub oak; *Papaipema speciosissima* G. & R. larvae in royal and cinnamon ferns.

Mr. Frank M. Jones, of Wilmington, Delaware, informs me that *Exyra semicrocea* Gn. in the 1909 list should be replaced by *Exyra rolandiana* Grt., the larvae of which occur in *Sarracenia* wherever that plant grows in any quantity in New Jersey. He has investigated the New Jersey records for *semicrocea* and found that the specimens were *Xanthoptera semiflava* Gn. in every case. *Semicrocea* is not represented from New Jersey in the New Brunswick collection and considering all of the evidence presented, should be omitted from the list.

LEPIDOPTERA.

Diacrisia virginica Fab. var. **fumosa** Strecker. Passaic Park, Jan. 20, 1915. Found in house on window. M. H. Mead.

Acronycta (Apatela) albarufa Grt. Lakehurst, middle of July. Buchholz.

Acronycta (Apatela) brumosa Gn. Lakehurst, end of May. Buchholz.

Acronycta (Apatela) lanceolaria Grt. Elizabeth, June 22. Buchholz.

Hadena stipata Morr. Elizabeth, 1st half of August. Buchholz.

Noctua rubifera Grt. Lakehurst, August & September. Buchholz.

Leucania (Heliophila) juncicola Gn. Lakehurst, middle July. Buchholz.

Leucania linita Gn. Newark, (Ang.); Elizabeth, May, August, (Bz.); Five-mile Beach, Aug. 12, (Haim.).

Leucania scirpicola Gn. Elizabeth, Lakehurst, July, August. Buchholz.

Leucania subpunctata Harvey. Lakehurst, Oct. 9, 1914. Shoemaker & Davis.

Hydroecia stramentosa Guenee. Passaic Park, Sept. 18. At arc light. M. H. Mead.

Papaipema duovata Bird. Larva in *Solidago sempervirens.* Elizabeth, Sept. 14 to 30. Buchholz.

Papaipema eupatorii Lyman. Larva in *Eupatorium purpurea.* Elizabeth, Sept. 20 to 30. Buchholz.

Papaipema frigida Sm. Larva in meadow rue. Union Co., Sept. 1 to 30. Buchholz.

Papaipema impecuniosa Grt. Larva in *Aster puniceus.* Union Co., Sept. 15 to 30, Buchholz. Passaic Park, Sept., Mead.

Papaipema pterisii Bird. Larva in *Pteris aquilina.* Union Co., Aug. 25 to Sept. 5. Buchholz. Passaic Park, Sept., Mead.

Papaipema harrisii Grt. Record in 1909 list based on misidentification. Does not occur south of Maine. Buchholz.

Papaipema cerina Grt. Union county, middle Sept. Larva in *Lilium canadense.* Buchholz.

Papaipema moeseri Bird. Union county, end Sept. Larva in *Chelone glabra.* Buchholz.

Papaipema merricata Bird. Elizabeth, Sept. 20. Larva in may apple. Buchholz.

Papaipema stenocelis Dyar. Lakehurst, Sept. 8 to 25. Larva in *Woodwardia virginica.* Buchholz.

Papaipema duplicata Bird. Union & Essex counties, Sept. 15 to 30. Larva in horse balm. Buchholz.

Papaipema maritima Bird. Union county, Sept. 20 to Oct. 10. Larva in *Helianthus giganteus* & *H. tuberosus*. This record should take the place of *necopina* in the 1909 list, which was wrongly identified. *Necopina* has never been taken south of Buffalo, N. Y. Buchholz.

Papaipema lysimachia Bird. Union county, Sept. 5 to 30. Larva in *Lysimachia quadrifolia*. Buchholz.

Papaipema baptisiae Bird. Union & Essex counties, Sept. 15 to 30. Larva in false indigo. Buchholz.

Papaipema astuta Bird. Union & Essex counties, Sept. 5 to 22. Larva in horse balm. Buchholz.

Papaipema anargyria Dyar. Elizabeth, Sept. 7. Larva in *Eupatorium*. Buchholz.

Papaipema rigida Grt. Union county, Sept. 5 to 30. Larva in *Heliopsis helianthoides*. Buchholz.

Ochria (Gortyna) buffaloensis Grt. Elizabeth, end August. Buchholz.

Scopelosoma ceromatica Grote. Passaic Park, April. M. H. Mead.

Epiglaea tremula Harv. Lakehurst, Sept. 25. Buchholz.

Chloridea virescens Fab. Lakehurst, Oct. 11, 1914. E. Shoemaker, W. T. Davis.

Schinia obscurata Strk. Elizabeth, June 5 to 30. Buchholz.

Autographa rogationis Gn. Elizabeth, Sept. 15 to 30. Buchholz.

Erastria includens Wlk. Elizabeth, July 5 to 20. Larva in *Carex stricta*. Buchholz.

Exyra rolandiana Grt. Spring Lake, Toms River, Pleasantville. Larva in *Sarracenia*. F. M. Jones.

Catocala fratercula Grt. var. **jaquenetta** Hy. Edwards. Lakehurst, July. Buch.

Epizeuxis nigellus Strk. Elizabeth, Lakehurst, July. Buchholz.

Anaplodes remotaria Wlk. Union & Passaic counties, July 20 to August 10. Buchholz.

Eois demissaria Hbn. Lakehurst, May 30 to June 20. Buchholz.

Apaecasia deductaria Wlk. Elizabeth, June 7. Buchholz.

Cleora tacenaria Pearsall. Lakehurst, July 17. Buchholz.

Euchlaena obtusaria Hbn. Lakehurst, May, July, September. Buchholz.

Priocycla decloraria Hulst. Lakehurst, July 3. Buchholz.

Gracilaria azaleae Busck. Larvae on azaleas. In greenhouses in northern New Jersey. Not common. H. B. Weiss.

How Does the House-fly Pass the Winter? (Dipt.).

By HENRY SKINNER.

In Entomological News, xxiv, 303, 1913, I published an article with the above title and stated that I believed that in the vicinity of Philadelphia *Musca domestica* lived through the winter in the pupal stage. This article led Dr. S. Moncton Copeman and Mr. E. E. Austen to investigate the same subject in England. They published the results of their investigations in "Reports to the Local Government Board on Public Health and Medical Subjects, New Series, No. 102, 1914, London, England." They sent out appeals, for specimens, to be published in certain journals. The notice was printed in "Country Life," "The Entomologist" and "The Entomologists' Monthly Magazine." From January 19 to April 27 they received fifty-eight consignments of flies, representing fifteen species. They gave an extensive tabulated report of the specimens received which is very interesting and instructive. Their summary and conclusion is as follows: "It will be seen from the appendix that the results obtained afford no support to the belief that house-flies hibernate in this country [England] in the adult state. The few specimens of *Musca domestica* sent in were all taken in an active condition; some of the other flies, however, such as the extremely common *Pollenia rudis* F., were often found partially dormant, and it is difficult to resist the conclusion that did the house-fly really hibernate in the adult state some evidence of the fact must have been obtained. The idea suggests itself that the relative lateness of the season at which house-flies annually become abundant may be due to the smallness of the number of individuals that, in an active condition, survive the winter in houses and other buildings, although it must be admitted that as yet [there is] nothing in the shape of proof that female house-flies found alive at the end of winter actually survive until oviposition takes place." They say in conclusion "it would appear that the customary explanation of the perpetuation of the house-fly from year to year has now been fairly tested, and that the evidence obtained fails to support it."

On February the 15th of the present year, the windows of the Entomological Department of the Academy of Natural Sciences of Philadelphia were opened on account of the mild weather, and house-flies (*Musca domestica*) came in. Previous to this date no flies were seen in the rooms. A local newspaper contained the following item: "Philadelphia experienced yesterday one of the warmest February 15ths in the history of the weather bureau. At 1.30 o'clock in the afternoon the thermometer touched 67 degrees F., which was the highest reached by the mercury on February 15th in forty years. As a result of the unusually mild weather conditions many men cast aside their overcoats, while hundreds of women appeared on the streets without furs." No special effort was made to obtain house-flies and only those that came conveniently within reach were caught. Some were netted and killed in a cyanide bottle and some were "swatted." Mr. E. T. Cresson, Jr., the well-known student of the Diptera, has given me the following report on the *Musca domestica* taken early this season.

Two females killed February 15th at the Academy. Chitin soft, and in drying the face and abdomen of the fly became very much shrunken. The clean pollen and undamaged bristles indicated recent emergence from the pupa.

One female February 17th showed same condition, but less shrunken.

One male February 23rd. Very much shrunken. This specimen was mutilated from the method of killing, being swatted.

One female Philadelphia, Pa., April 6th. Well developed and clean.

It is significant that no hibernated specimens were seen. Also that a freshly-emerged male was taken. It is, therefore, a fact that house-flies of both sexes emerge from pupae in the late winter or early spring and that these flies are capable of producing the heavy summer broods. These facts show how little we really knew about this very common insect in relation to hibernation, and there is still much to be known and put on a firm basis. It is hardly worth while to speculate in regard to the living through of some females capable of oviposition in the spring. This awaits exact observation. It will also be of value to look for living pupae in the winter and early spring.

Observations in Southern Pines, North Carolina (Hym., Col.).

By Abram Herbert Manee.

Vespa cuneata = V. carolina Linn. (Hymenoptera.)

About three years ago Mr. Charles Schaeffer suggested that I investigate the suspicion that the large *Vespa carolina* might be a form of *V. cuneata.* I had observed that *carolina* was always female, was always solitary and in spring or early summer was about some large pine stump; that *cuneata* male was rare and in autumn *cuneata* female was busy in young pines or was attracted to wet spots on trunks of oaks.

About noon of October 28, 1914, on a woodsy side road my wife noticed some hornets about a hole in the ground, and as I found them to be females of *cuneata* I knew my opportunity was at hand. The next day with my nippers I took at the opening about 250 specimens, at first females that were going in or coming out for forage, latterly males who were disturbed by my poking into the nest. Then I removed the covering of leaves and scooping out the contents with my hands disclosed a smooth perfectly bowl-shaped excavation. This was lined with wasp paper. At the rounding bottom was a small thick disc of comb containing grubs, a few empty cells and, in sealed cells, some pupae and imagines of *Vespa carolina.* The second tier was a larger disc comb, also containing the three stages of *carolina.* The third comb was also a perfect disc, nearly seven inches in diameter but thin and with many cells empty, with a few at edge with grubs and with some sealed cells containing pupae and imagines of *V. cuneata,* some males, some females. The fourth comb was like the third but with more of the cells empty. The fifth and top disc came out in pieces but was entirely empty and looked somewhat dry and old. The cover of woods debris allowed an exit at the right corner of a mouth-shaped aperture.

Of the 539 free specimens taken 330 were *cuneata* males, evidently drones somewhat sluggish and abiding in the nest; 174 were *cuneata* females, workers busy at the care and feed-

ing of grubs with probably a large number away for forage, and 35 were *carolina* queens. It seemed evident that the queens and males and some workers had but recently emerged. It is probable that most of the workers had developed in the uppermost comb and in time to foster the life in the lower tiers.

The male has a longer body with one more cross stripe than has the worker. The queen name *carolina* must prevail for the species even if it were not older than *cuneata,* unless, for historical import, it be henceforth known as *cuneata-carolina.*

.Dynastes tityus (Coleop.) and Sphecius speciosus (Hymenop.)

My first sight of *tityus* was on coming south in the autumn of 1904, when I found a dead female in our barn and the World of the Little grew larger. On June 26, 1905, a pair was brought to me from an orchard of early peaches. In after summers I would take 50 to 75 specimens at their mid-July gathering in and under a single tree of early apples. Their allurement was the over-ripe or rotting fruit. Earlier and later they came to peaches. plums and pears. Here is a decided example of mimetic coloring not only in the normal brown-spotted pear-green but in the occasional wholly brown wing, or wings exactly the hue of a rotten apple or pear. The natural odor of living specimens is peculiar and very strong. This, in connection with denatured alcohol and the decay of body contents, renders specimens so preserved somewhat offensive, but in time the smell will pass away.

In my ten years here I have not seen the pupa, but several times have taken the huge grubs in the rotting side-roots of old pine stumps. October 17, 1914, I thus found larvae and a small female imago. But of most interest is the peculiar habit of a late summer gathering on ash trees. I was told that the tropical *hercules* clustered on tree trunks. On July 30, 1909, a boy brought me 31 *tityus* and the next day 155 more, all taken from an ash tree at a farm two miles south. August 22, 1910, the same boy brought me 189 specimens taken from the same tree, which he called black ash. On September 3,

1912, I discovered, a few rods from my home, the only ash tree of which I know as within a radius of two miles and from it took 27 living *tityus* and from the ground many dead specimens. I noticed that the branches of the ash bore fresh long gashes through the bark; also that several of the big wasp *Sphecius speciosus* were flying about the upper limbs. In 1913 I saw at this ash tree not one *tityus,* but found *Xyloryctes satyrus* burrowing at the base of the trunk. In July, 1914, I took from this one ash tree 387 live *tityus* and observed on the bark of the branches the deep scratches which the beetles had made or were making and, at the abandoned scars, wasps, *Arachnophroctonus atrox* or *Sphecius speciosus,* were eagerly at work evidently feeding on some exudation of the wounded inner bark, though to me the spots looked dry. At times two female *speciosus* would contend and fall together to or near the ground in combat; at times a wasp would attack a beetle as if in hungry impatience it would drive it from the coveted feast. Only three or four pairs of *tityus* were mating, but on the ground a few of each sex were burrowing at the base of the ash and also at nearby dogwoods. I also took from the ground some male *Xyloryctes.*

On August 4, I observed a large number of fresh scars on the rough outer bark of the ash trunk and two or three half-inch holes freshly bored to the wood. At one of these holes, three feet from the ground, a female *tityus* was at work but it did not attempt to oviposit nor could I find an egg. The beetle was restless and leaving the hole began a spiral climb to the branches, ten feet above, and as it moved it would here and there, with an upward push of its head, remove a crumb of bark. The object of this or of the half-inch holes I could not conceive and of course I left the beetle to mother a next season's progeny, which I suspect requires two years for maturing. November 13, I dug at the base of the ash tree and found two male *Xyloryctes* hibernating (also three nymphs of *Cicada sayi*), but no grubs and no trace of *tityus.* The roots were all sound.

Dynastes tityus varies remarkably in size. Males are from

35 mm. x 19 mm. to 60 mm. x 28 mm.; females from 35 mm. x 18 mm. to 50 mm. x 25 mm., while one female, almost a freak in size, attained to 52 mm. x 27 mm.

As to the Cicada Killer, *Sphecius speciosus,* I have seen it climbing a telegraph pole, with its heavy burden of *Cicada marginata,* that it might glide on a stage of its nestward journey; I have seen by a roadside its inch-wide hole in the ground; I have seen it in early July with the male of *Sphaerophthalma occidentalis* feeding at the gum of acorn buds; I have seen it later at wet spots on trunks of oaks as also at *tityus* scratchings on ash limbs and, like hornets and some Lepidoptera, it may feast on the dropped fruit of persimmon.

A Wasp Resembling a Bee (Hym.).

By T. D. A. Cockerell, Boulder, Colorado.

All entomologists have heard of the remarkable resemblances between certain butterflies of quite different families, but it is not so well known that in Australia the aculeate hymenoptera present some astonishing examples of "mimicry." A new example, now before me, is found in a small wasp of the genus *Miscothyris,* from Gilgai, New South Wales, December, 1911 (*W. W. Froggatt* 211), which in appearance and markings almost perfectly resembles certain bees, more particularly *Euryglossa geminata* Ckll., both being black, with the same general arrangement of yellow markings on the scutellum, postscutellum, second abdominal segment, &c. The *Miscothyris* appears to represent a color-variety of *M. lucidulus* Turner.

Miscothyris lucidulus mimeticus n. race.

♂. Like *M. lucidulus,* but flagellum ferruginous beneath; upper border of prothorax (except laterally), spot on tubercles, large mark behind them, as well as scutellum and postscutellum, clypeus, lateral face marks, triangular supraclypeal mark, scape (except a black mark behind), and spot on each side of second abdominal segment, all bright chrome yellow; anterior tibiæ with a broad yellow band in front.

M. lucidulus was described only from the female; it is possible that the differences found in the present insect are sexual, but they probably indicate a local race. Two specimens are before me. The type is in my collection; it will, however, eventually rest in some large museum.

List of Coleoptera Collected from Tanglefoot.

By C. A. Frost, Framingham, Mass.

The following species of beetles were taken from bands of tanglefoot on two large white oak trees in Sherborn, Massachusetts. These trees are situated in a pasture at the foot of a wooded hill and are partly surrounded by a sparse growth of hardwoods which are replaced on the east by alders that extend to an open meadow a few hundred feet away.

The results of the first visit on September 27th were so surprising that a second trip was made to secure any small specimens that had been overlooked. On the shaded side of one of the trees next the swamp most of the specimens were badly moulded and were not removed at all, while a few other specimens looked as though they had been pecked by birds. These two trees, which are nearly three feet in diameter, were banded about the first of June so that most of the material must have been entangled for many weeks and some of it for three months. Most of the specimens were dug out as mere gobs of tanglefoot and dropped into the alcohol bottle where they remained about five hours. They were then found to be very clean except for a whitish substance on a few of them. The large ones were also relaxed enough to pin while the legs and antennae of the small specimens could be drawn out by the careful use of a fine brush.

The number of rare species is the most remarkable fact in this list for, in the fourteen years of my collecting in Massachusetts, I have never before taken *Cinyra gracilipes, Fornax calceatus, Catorama nigritulum, Dorcatoma dresdensis, Abstrulia tessellata, Canifa pusilla, Helodes thoracica* or *Heterachtes quadrimaculatus,* and but single specimens of *Entomophthalmus rufiolus* and *Callidium aereum; L. cava, S. punctatus, C. sexsignata, C. bicolor,* and *H. unifasciata* have been exceedingly rare.

On my return from the second visit to the trees (October 3, 1914), I examined some red oaks that had been banded with tanglefoot in 1911 or 1912 and took therefrom single specimens of *Bostrychus armiger* Lec. and *Notiolophus semistriatus*

Say. They were about the only specimens in recognizable condition.

The summary of the following list shows a total of 83 specimens representing 39 species.

LIST OF SPECIES AND NUMBER OF SPECIMENS OF EACH.

2 *Axinopalpus biplagiatus* Dej.
1 *Lomechusa cava* Lec.
2 *Adalia bipunctata* Linn.
6 *Scymnus punctatus* Melsh.
1 *Scymnus tenebrosus* Muls. (?).
1 *Lathropus vernalis* Lec.
1 *Tenebrioides corticalis* Melsh.
1 *Cyphon collaris* Guer.
1 *Cyphon variabilis* Thunb.
6 *Deltometopus amoenicornis* Say.
1 *Fornax calceatus* Say.
4 *Entomophthalmus rufiolus* Lec.
8 *Elater obliquus* Say.
4 *Melanotus trapezoideus* Lec.
2 *Melanotus communis* Gyll.
4 *Cinyra gracilipes* Melsh.
3 *Chrysobothris sexsignata* Say.
6 *Ellychnia corrusca* Linn.
1 *Cymatodera bicolor* Say.
1 *Helodes thoracica* Guér.
2 *Hydnocera unifasciata* Say.
2 *Hydnocera pallipennis* Say.
1 *Hydnocera verticalis* Say.
2 *Catorama (Hemiptychus) nigritulum* Lec.
1 *Dorcatoma dresdensis* Hbst.
1 *Cis fuscipes* Mellié.
2 *Callidium aereum* Newm.
1 *Heterachtes quadrimaculatus* Newm.
4 *Xanthonia* 10-*notata* Say.
2 *Dibolia borealis* Chev.
1 *Platydema subcostatum* Lap.
1 *Mordellistena trifasciata* Say.
1 *Abstrulia tessellata* Melsh.
1 *Canifa pusilla* Hald.
1 *Pandeletejus hilaris* Hbst.
1 *Otidocephalus chevrolati* Horn.
1 *Dryophthorus corticalis* Say.
1 *Pityophthorus minutissimus* Linn.
1 *Xyleborus* sp.

Photographing Insects under Magnification.

In *Camera Craft* for October, 1914, there appeared an article by Samuel B. Doten, Entomologist and Director of the Nevada Agricultural Experiment Station, entitled, "A Cold Flame for Zoological Work."

Judging from the title, it is not suggestive of an article that would interest entomologists, but it is, however, the results of experiments conducted in the entomological field and is excellently illustrated by half tones from photographs. These represent a few insects in their natural attitudes, and well defined, especially aphids, photographed under magnification illuminated by the intense light of fused silver wire. The paper treats mainly of sources of proper lighting without heat for photographing life under magnification. It is evident that such illumination must not have a high temperature. Entomologists desiring photographs of insects showing their natural attitudes will probably find Dr. Doten's methods of value. He promises further details in the near future should his readers be interested sufficiently to ask for them.—E. T. C., JR.

Notes on Some Species of Tischeria, with Descriptions of New Species (Lep.).

By ANNETTE F. BRAUN, Cincinnati, Ohio.

Under the names *Tischeria badiiella* and *T. purinosella* respectively, Chambers described two species of *Tischeria*, both of them miners in leaves of white oak (Cin. Quart. Jn. Sci., II, 109, 110, 1875). In regard to the mine of the former species, he says that it is usually placed near or at the edge of the leaf, is whitish while fresh, becoming yellowish when dry. The mine of the latter species he does not characterize.

Specimens of the only species having a mine of this appearance that I have bred in the region of Cincinnati combine the characteristics of the published descriptions of both species. *Badiiella* seems to differ from *purinosella* chiefly by the absence of the usual conspicuous dusting in the apex of the wing; such specimens are rather rare in a bred series. On the other hand, almost all of the specimens have the line of dusting along the basal half of the dorsal margin. All of the specimens, however, agree much more closely with the description of *T. albostraminea* Wlsm. (Proc. U. S. N. M., XXXIII, 224, 1907). whose mine on oak has been described by Mr. Busck (Proc. Ent. Soc. Wash., XI, 103, 1909). The small costal spot at two-thirds, which is not mentioned by Chambers in either description, is without exception present, even in the palest specimens.

The species should therefore be known as *Tischeria badiiella* Chambers; *T. purinosella* and *T. albostraminea* will then sink as synonyms.

Tischeria immaculata n. sp.

Head, including tuft and palpi, gray, tips of the scales white; antennae gray.

Thorax and fore wings gray, with the tips of the scales white, so that the wing presents a uniformly speckled appearance under a lens. There is no indication of other markings. Hind wings and cilia gray.

Legs gray, scales white-tipped as on the fore wings, except the hind tibiæ and tarsi, which are pale yellowish. Abdomen yellowish, especially posteriorly.

Expanse: 7.5-8 mm.

Twelve specimens, Loma Linda, California. The larva is a miner on *Prunus ilicifolia,* a shrub with small, thick, spiny-edged leaves. The mine is visible on the upper side of the leaf as a short elongate ridge, the loosened epidermis being raised slightly above the general surface of the leaf. The entire length of the mine is not greater than 1 cm., its breadth 2 or 3 mm. At emergence the pupa is thrust through the lower epidermis. Mines received from Mr. G. R. Pilate in April; imagos at the end of the same month.

Types in my collection.

In addition to the well known *Tischeria ceanothi* Wlsm., there are at least two species of *Tischeria* mining on other species of *Ceanothus* in California. One of these resembles *T. ceanothi* very closely, but seems to be entitled to specific rank. The other approaches more closely to the type of the oak-feeding species in coloration and markings.

Tischeria ambigua n. sp.

Entire head, palpi and antennae dark gray, scales tipped with white. Tuft on basal segment of antennae unusually long.

Fore wings gray, scales white-tipped; base of wing darkened especially on the costa; a darker transverse tornal spot, sometimes reaching half-way across the wing. In general, there is a paler area extending along the middle of the wing from base to two-thirds. Hind wings and cilia gray, faintly tinged with ocherous.

Fore and middle legs dark gray; hind legs yellowish, with the tarsal segments dark-tipped. Abdomen becoming yellowish posteriorly.

Expanse: 10.5-11 mm.

Three specimens, Fredalba, San Bernardino County, California. The larva is a miner on a small, thick-leaved species of *Ceanothus.* The mine begins as a short linear tract perpendicular to the midrib, soon bending sharply on itself, and broadening into a short, elongate blotch, which is deep yellow in color. The pupa is thrust through the lower epidermis at emergence. Mines and imagos in the latter part of August.

Types in my collection.

In addition to the slight differences in color and markings, viz., the darker head and absence of brown in the ground color, individuals of this species are of considerably larger size than those of *T. ceanothi,* of which the larger specimens do not exceed 9 mm. in expanse.

Tischeria bifurcata n. sp.

Face, palpi and antennae very pale yellow, tuft on head usually deeper yellow, occasionally with a few fuscous scales.

Ground color of the fore wings variable; sometimes the wing is very pale yellow at the base, shading to deep yellow toward the apex; at the other extreme are specimens in which the deeper color extends to the base of the wing; such specimens have the apex of the wing much darkened, the color becoming almost orange. Base of the costa fuscous; sometimes merely the extreme edge of the costa is dark, sometimes there is a streak of scattered fuscous scales along the costa from the base to the middle of the wing. There are scattered darker-tipped scales. These are more plentiful near the costa, where they form the dark streak just referred to, and in the apex of the wing. Hind wings and cilia pale yellow.

Legs pale yellow, anterior pair shaded with fuscous externally. Abdomen yellow, shading to fuscous posteriorly.

Expanse: 8 mm.

Twelve specimens, Fredalba, San Bernardino County, California. The larva is a miner in leaves of a species of *Ceanothus*. The work of the larva is very characteristic, differing in appearance from that of the other species, though retaining the general characters of the genus. The mine starts as a linear tract, curving upwards and meeting the midrib in the upper

Mine of *Tischeria bifurcata*.

third of the leaf, whence it follows the course of the midrib downwards to a point about one-third from the base of the leaf, where it branches to either side. In these branches the greater part of the parenchyma is consumed, so that the mine is somewhat transparent and the epidermis is brownish discolored in spots. From *a* to *a'*, as shown in the figure, the mine is lined with silk and the lower epidermis projects as a ridge on the underside, forming a tube into which the larva retreats when disturbed. Pupation takes place in the part of this tube which lies over the midrib; the pupa is thrust out at the upper end on the underside of the leaf at emergence.

The mines were collected by Mr. G. R. Pilate in the middle of August; the imagos appeared August 31 to September 2.

Types in my collection.

Heteroptera in Beach Drift.

By J. R. de la Torre Bueno, White Plains, New York.

In 1904, Professor James G. Needham published a paper on beetles in beach drift,* setting forth a remarkable occurrence of *Lachnosterna* on the shores of Lake Michigan, where they were cast up by wind and tide in the summer of that year. This is the only formal paper bearing on this subject I am acquainted with, although allusions to beach collecting and to spring flights of insects which take them over waters, drowning or overcoming them, to become the prey of insectivorous animals of various kinds and the specimens of entomologists, are not uncommon in the literature. Of Heteroptera, I have no knowledge of other than stray records of species found on the tide line.

Apart from this being a ready means of collecting, Heteroptera in beach drift are worthy of notice and indeed are of great interest, since at such times the winged form of normally apterous species may be found, making it possible to secure these very desirable rarities, and, of course, in many instances, perfecting our knowledge of certain species. It is notable also in that many cryptic species emerge from their ordinary hiding places and are thus seen to be of much greater abundance than one might judge from the stray individuals taken here and there.

Another peculiarity is that there is seemingly no fixed atmospheric condition making for these flights, which, so far as observed, are not nuptial in character in the Heteroptera. Those that I have personally secured have been found in July and October, as noted further on. The wind, of course, has to be in particular directions as regards the water. In bodies of fresh water, the numbers found must be less than in salt water, as the top-feeding fishes abound in the former and they must eat very many.

The importance of this form of collecting, apart from its ecological significance, is perhaps best illustrated by the cap-

*Beetle Drift on Lake Michigan, Canadian Entomologist, xxxvi, pp. 294-6.

ture at West Point, New York, by Col. Wirt Robinson, of four specimens of the extremely rare bug *Acantholoma denticulata* Stal, known heretofore only from the type locality and type specimen from Illinois, and recorded only twice since from other parts of the country. Another find on the Long Island beaches is *Leptoglossus magnoliae* Heid., taken by Mr. F. M. Schott on the tide line at Rockaway, the first record from north of Washington, D. C.

At Point Pleasant, New Jersey, on July 27, 1905, a little girl brought me a small can full of insects cast up by the waves of the Atlantic on the beach—there were Diptera, Hymenoptera, Coleoptera, all much the worse for wear, and among them the following Heteroptera: *Mineus strigipes* H. S., *Apateticus* sp., *Euschistus variolarius* P. B. and *E. ictericus* Linné. This last was not uncommon in the sedges in the salt marshes about the beach.

On August 8, although I had watched for a repetition of the phenomenon from day to day in vain till that date, I secured one *Arilus cristatus* Linné, drowned.

Four years later (1909), I was on the beach at Rockaway, Long Island, on September 12, for the specific purpose of getting Heteroptera in the drift. Only six species were collected in the course of the day, which was rather cold and windy. Of these, *Apateticus cynicus* Say was the most abundant, no less than 13 being secured. The others were *Apateticus serieventris* Uhler, also common; *Amaurochrous cinctipes* Say, two only; *Euschistus euschistoides* Voll., and *E. variolarius* P. B., both very common; and *Ligyrocoris diffusus* Uhler, one specimen.

While the insects were pretty wet and draggled, they were not dead, and as soon as they began to get dry they showed signs of getting ready for flight.

Another four years passed before it was possible for me to secure some more beach drift Heteroptera, although I had in the meantime been on the beaches at times supposed to be propitious for this form of collecting. While spending a July day (the 19th) on Fire Island Beach, at Smith's Point, on the long sand dunes separating the ocean from Great South Bay, the

opportunity presented itself for securing some more drift bugs. As I recollect, the day was very windy, but it was warm in the sun, with clouds from time to time making chilly moments. On hands and knees I crawled about a mile up and down the beach, along the line where the receding waves left a narrow windrow of insects for about that distance. In passing, I may note that the places of abundance of drift insects in the ocean beaches hereabout are very restricted as to length, sometimes about a mile, as in this instance; at other times only some hundreds of feet. In my own experience I have not seen longer stretches, but others may have done so.

On this occasion, the Heteroptera predominated over all the other groups put together, the most abundant species being the Myodochid *Eremocoris ferus* Say, of which some twenty were found, some perfect, others much dilapidated by the action of the waves. *Apateticus maculiventris* and *Euschistus variolarius* were abundant as usual, closely followed by the recently decribed *Corizus hirtus* Bueno, of which some nine were secured. The rather rare *Pseudocnemodus canadensis* Prov. and the infrequent *Aradus uniformis* Heidemann were not uncommon, there being four of the long-winged form of the latter and five of the former, these being somewhat battered. The normally apterous species, *Gerris remigis* Say and an unknown Tingid were secured, one of each species. The other forms found were:

Apateticus cynicus Say, three specimens.
A. bracteatus Fitch, only one.
A. maculiventris Say, abundant.
Perilloides circumcinctus Stal, one.
Mormidea lugens Fabr., another common species, not taken or counted.
Euschistus variolarius P. B., the same.
E. politus Uhler, seven specimens.
Coenus delius Say, only one specimen found.
Thyanta custator Fabr., three.
Th. calceata Say, two.
Nezara pennsylvanica, P. B., a very rare species, one.
Schirus cinctus P. B., one only, very lively, and digging into the sand for shelter.
Alydus eurinus Say, and *Megalotomus quinquespinosus* Say, one of each.
Corizus lateralis Say, two specimens.
C. hirtus Bueno, nine, as already noted, all long-winged.
Lygaeus kalmii Stal, three.

Nysius minutus Uhler, one.
Pseudocnemodus canadensis Provancher, four long-winged.
Emblethis vicarius Horv., two.
Eremocoris ferus Say, as noted.
Aradus uniformis Heid., five; two or three with mites on the underside.
A. abbas Bergr., one.
Neuroctenus simplex Uhler, one.
Gerris remigis Say, one winged, very rare form.
Gerris marginatus Say, two.
Reduviolus ferus Linné, one.
Zelus socius Uhler, one.
Acanthia humilis Say, one very lively specimen of this small species was found; possibly others had got away.
The truly aquatic Hemiptera had only two representatives, one specimen each of
Corixa interrupta Say, and
Corixa pectenata Abbott.

In addition to the Tingid mentioned, there were two specimens of a Myodochid that I have been as yet unable to place to my satisfaction.

The following year, 1914, I spent a couple of hours on the beach at Arverne, in about the same part of Long Island, on the 3d of October. Away from the water, the weather was warm, and even sultry, but down on the beach it was raw and windy, with a heavy sea breeze. The Hemiptera found were scattered along some hundreds of yards of beach and were quite active for all their sea bath. The most abundant species was *Amnestus spinifrons,* of which seven specimens were secured, the next being *Brochymena quadripustulata,* which yielded six.

This is the total list found, which, while small in numbers, was interesting as to species and condition.

Apateticus serieventris Uhler, three.
Trichopepla semivittata Say, one.
Mormidea lugens, Fabr., one.
Euschistus variolarius P. B., one.
Hymenarcys nervosa Say, one.
Nezara hilaris Say, one.
Brochymena quadripustulata, Fabr., six.
Amnestus spinifrons Say, seven.
Amnestus pusillus Uhler, three.
Chariesterus antennator Fabr., two, which were covered beneath with a heavy farinose pruinosity.
Nysius ericae Schill., one.
Ischnorhynchus geminatus Say one.
Crophius disconotus Say, one (a rather rare species).

This completes the tale of my own collecting on the neighboring salt waters. Last year, however, it was my good fortune to come into possession through the courtesy of Mr. John

D. Sherman, Jr., who collected the specimens, of a small lot of Heteroptera found on the shores of the Lake at Marquette, Michigan, in July. The fresh water aquatic forms, ordinarily abundant in bodies of still water, were but slightly represented, there being only one *Belostoma fluminea* Say, one *Arctocorisa nitida*, several *Gerris rufoscutellatus*, and one *G. remigis*. Of the land forms, the most abundant were *Thyreocoris unicolor*, represented by about twenty or more specimens, *Sehirus cinctus* in about the same number, and to judge from the fragments, over thirty *Galeatus peckhami*, another species known only from the type, and some one or two other specimens in collections, and therefore a most desirable form from every point of view. The full list of the species is:

Perilloides exaptus Say, two.
Pentatoma persimilis Horvath, one.
Comopepla lintneriana Kirk., one.
Banasa dimidiata Say, two; apparently not yet known from Michigan.
Sehirus cinctus P. B.
Thyreocoris unicolor P. B.
Alydus conspersus Mont., two.
Lygaeus bicrucis Say, two.
Lygaeus kalmii Stal, one.
Nysius ericae Schill., one.
Cymus discors Horv., two; as this species dwells in cat-tails, it is not surprising to find it in drift.
Geocoris bullatus Say, one.
Sphragisticus nebulosus Fall., two.
Eremocoris ferus Say, one.
Corythuca pergandei Heid., one.
Galeatus peckhami Ashm.
Orthostira lillias Bueno MS., one long winged; a rare form.
Reduviolus subcoleoptratus Kirby, two of the very rare macropterous form, of which in thirteen years' collecting I have been able to secure only two, and of which there are not a dozen known specimens all told in collections.
Gerris remigis Say, apterous form, therefore a stray.
Gerris rufoscutellatus Latr.
Belostoma fluminea Say.
Arctocorisa nitida Fabr.

Eliminating duplications, there was a total of 66 species found under these conditions, 22 in the lake and 49 on the ocean beach, five being found in both situations, these being *Sehirus cinctus, Nysius ericae, Eremocoris ferus, Lygaeus kalmii* and *Gerris remigis*. The seashore specimen, however, was not a shipwrecked navigator, but a true flier, as noted. These species totalled 300 specimens approximately, or over, as no count was kept of the common forms. The families were represented as follows, in the order of the number of species, which is nearly the order of their abundance:

Cimicidae, 30 species and 183 specimens, 5 species totalling about 100 specimens.

Myodochidae, 14 species, over 20 specimens of one of them, and a total of over 46 specimens.

Coreidae, 7 species and 18 specimens.

Tingids, 4 species and 35 specimens, some 32 being *Galeatus*.

Reduviidae, 4 species and 5 specimens.

Aradidae, 3 species and 8 specimens.

Aquatics, all families, 9 species and 16 specimens, of which nearly half were *Gerris rufoscutellatus*.

Miridae were not collected, as they were by far too dilapidated to be of much service.

The relative abundance of the families is what should be expected, in view of the fact that the Cimicidae are abundant in numbers and strong fliers, and that the Myodochidae, next to the Miridae, are the largest of the Heteropterous families and most abundant as to individuals. No significance is to be attached to the presence of water-bugs in the lake drift, as these were probably drowned by their own element. Those on the ocean shore, however, had got there by flight, and at the time they were taken were quite lively.

This is in the nature of a preliminary report, and it is hoped that later study may be more enlightening as to the precise conditions that determine these flights and their significance, as well as the season of the year when they are most likely to take place.

Ecto or Endoparasitism? A plea for Greater Definiteness in the Citation of Host Data in the Parasitic Hymenoptera.

There is a strong tendency among students of parasitic Hymenoptera and economic entomologists to ignore the matter of the exact relation of the parasitic larva to the body of the host, i. e., whether it is ecto- or endoparasitic. Many authors, even though they themselves rear the parasites, are content to record merely "bred from," "reared from," or "parasitic upon" such and such a host. Quite often, it is true, one can make a plausible guess from a knowledge of closely-related forms, but this method cannot be universally applied with safety.

The economic importance and the purely scientific value of bionomical studies in the parasitic Hymenoptera demand an ever-increasing exactness of observation and record. Those who publish on material which they have reared are usually in a position to state whether the parasites are external or internal in habit. If this information is given, the value of their contributions will be increased.—C. H. RICHARDSON, New Jersey Agricultural Experiment Station, New Brunswick, N. J.

ENTOMOLOGICAL NEWS.

PHILADELPHIA, PA., JUNE, 1915.

Incomplete Titles.

A graduate student in zoology in one of the Universities of the eastern States was once heard to say that her professor had told her that a candidate for the doctor's degree ought to know the names of all the principal genera of the animal kingdom. The reader of these lines is receiving this remark at third hand, so that he is entitled to doubt either the accuracy of the reporters or the justness of the original. There are, however, even in the year 1915, authors of entomological papers who tacitly assume that editors and readers of journals to which they send their contributions really do possess the astounding lexicographical requirement which terrified the fair graduate. The entomological author of *The Butterfly Hunters in the Caribees* estimated that Dr. Joseph Leidy (with whom he conversed on the subject), knew "3000 geological and zoological names," and tells us, without giving his authority, that Cuvier and Louis Agassiz could promptly give the names "of over 5000 animals," and that Dr. Asa Gray knew quite 8000 plants by name. The Index to Professor John B. Smith's 1909 list of the Insects of New Jersey contains about 4250 names of families and genera. Are there any who can place from memory all the generic names of this list in their proper families or even orders? Yet the insect fauna of New Jersey is but a small part of the total fauna of the world. After all, the speaker referred to in our opening sentence may have thought only of the names of Linnean genera.

This relief does not help out with the authors of 1915, and to them we put the question: Is it fair to expect the readers of a journal publishing on insects of all groups to know what *Tephrochlamys* is without adding any explanation? If an explanatory abbreviation *is* to be placed after the title, is it fair to throw the burden of supplying it on the editor? If he publishes your paper without any such explanatory abbreviation, isn't it poor editing? Why should his time, quite as valuable as *yours*, dear author, be consumed with supplying your deficiencies? Would he not be justified in rejecting your contribution on this ground?

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

Entomologists in the War Zone.

A letter from Dr. Karl Jordan, dated Tring, April 8, 1915, to Dr. Henry Skinner, states that Dr. Walther Horn, Dr. H. Schouteden and M. Guillaume Severin are well and at their posts in their respective museums (Berlin-Dahlem, Tervueren and Brussels.) The writer had been unable to get into communication with Dr. Anton Handlirsch in Vienna.

A Mistake of a Butterfly (Lep.).

Mr. E. E. Barnard writes in *Nature*, April 15, 1915, that, while looking at a bright-colored "eye" of a peacock's feather in the band of a man's hat, he saw a butterfly floating above. It suddenly alighted on the "eye" and apparently began trying to extract food from it. After several minutes it flew away as if satisfied that it had made a mistake. It was evidently guided entirely by sight in seeking food in this case.

Cerambycid in Bedstead (Col.).

Recently one of my students brought in a larva which he found working in the bedstead in his room. The larva had bored into the rail, apparently from the inside, and was still working when found. It was evidently a Cerambycid, but in order to determine the species, the specimen was sent to Dr. L. O. Howard at Washington, who writes that Mr. F. C. Craighead, Specialist of Forest Insects, identified it as the larva of *Eburia 4-geminata* Say. This insect commonly feeds in seasoned oak, ash, hickory, etc., but the interesting question about this particular case is when did the larva get into the bed rail and how long has it been there?

In tracing the history of the bed, I find that the present owner purchased it in LaFayette nearly twenty years ago, and it has been in constant use since that time. Another board in the bedstead shows unmistakable signs of having been "worm eaten" when put into the bed, and that would seem to indicate that these eggs were laid before the lumber was worked up. If so, this larva is at least twenty years old. Dr. Lintner makes mention, in his Fourth Report, of instances where members of this family have been known to escape from furniture many years after the furniture was made up, and while it is generally known that the absence of moisture and lack of air, caused by polishing and varnishing of the lumber, will retard the rapidity of development of the larvae of borers to a certain extent, it hardly seems possible that the larval period would be prolonged for eighteen or twenty years, as in this case; and yet I cannot account for it in any other way, as the excavations all indicate that they were made from the inside. This species is quite rare in Indiana, and is the only species of *Eburia* found in the State.—J. Troop, Purdue University, LaFayette, Indiana.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of systematic papers are all grouped at the end of each Order of which they treat, and are separated from the rest by a dash.

Unless mentioned in the title, the number of new species or forms are given at end of title, within brackets.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London.

For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

4—The Canadian Entomologist. **22**—Zoologischer Anzeiger, Leipzig. **34**—Proceedings, Iowa Academy of Sciences, Des Moines. **66**—Die Naturwissenschaften, Berlin. **81**—Biologisches Centralblatt, Erlangen. **97**—Zeitschrift fur wissenschaftliche Zoologie, Leipzig. **143**—Ohio Naturalist. **161**—Proceedings, The Biological Society of Washington. **166**—Internationale Entomologische Zeitschrift, Guben. **180**—Annals, Entomological Society of America. **189**—Journal of Entomology and Zoology, Claremont, Calif. **198**—Biological Bulletin, Marine Biological Laboratory, Woods Hole, Mass. **204**—New York State Museum, Albany. **313**—Bulletin of Entomological Research, London. **344**—U. S. Department of Agriculture, Washington, D. C. **359**—Connecticut Agricultural Experiment Station, New Haven. **394**—Parasitology, Cambridge, England. **456**—Kosmos, Handweiser fur Naturfreunde, Stuttgart. **490**—The Journal of Parasitology, Urbana, Illinois. **504**—Scientific Proceedings, Royal Dublin Society. **505**—Agricultural News, Barbados. **506**—Bulletin, Torrey Botanical Club.

GENERAL SUBJECT. Britton, W. E.—Report (14) of the state entomologist of Connecticut, **359,** An. Rpt., 1914, 113-198. **Crampton, G. C.**—Suggestions for the standardization of technical terms in entomology, **180,** viii, 74-8. **Felt, E. P.**—Report (29) of the state entomologist on injurious and other insects of the state of New York, **204,** Bul. 175. **Forbes, S. A.**—The ecological foundations of applied entomology, **180,** viii, 1-19. **Grossenbacher, J. C.** Medullary spots and their cause [Cause, insect mining], **506,** xlii, 227-39. **Lovell, J. H.**—Insects captured by the Thomisidae, **4,** 1915, 115-6. **Osborn, H.**—Entomological work in Ohio, **143,** xv, 453-62. **Treherne, R. C.**—Notes of economic interest from British Columbia, **4,** 1915, 101-4.

PHYSIOLOGY AND EMBRYOLOGY. Strindberg, H.—Zur eifurchung der Hymenopteren nebst einigen damit zusammenhangenden fragen, **22,** xlv, 248-60. **Woolsey, C. I.**—Linkage of chromosomes correlated with reduction in numbers among the species of a genus, also within a species of the Locustidae, **198,** xxviii, 163-86.

MEDICAL. Kellogg, V. L.—Spider poison, **490,** i, 107-12.

ARACHNIDA, ETC. Nuttall, G. H. F.—Observations on the biology of Ixodidae; Artificial parthenogenesis in ticks, **394,** vii, 408-56; 457-61.

NEUROPTERA, ETC. Foster & Jones—The life history and habits of the pear thrips in California, **344,** Bul. 173. **Lloyd, J. T.**—Notes on Ithytrichia confusa, **4,** 1915, 117-21. **Noyes, A. A.**—The proventriculus of a Hydropsyche larva, **189,** vii, 34-44. **Peterson, A.**—Morphological studies on the head and mouth parts of the Thysanoptera, **180,** viii, 20-66. **Quiel, G.**—Anatomische untersuchungen an Collembolen, **97,** cxiii, 113-64.

HEMIPTERA. Nanayama, S.—Notes on the life history and habits of the rose scale, Aulacaspis rosae, **189,** vii, 45-54. **Stafford, E. W.**—Studies in Diaspinine pygidia, **180,** viii, 67-73.

Baker, A. C.—The woolly apple aphis, **344,** Of. Secty., Rept. 101.

LEPIDOPTERA. Berry, G. H.—A list of the L. of Linn County, Iowa, **34,** xxi, 279-316. **Braun, A. F.**—Life histories of N. A. Tineina, **4,** 1915, 104-8. **Pellett, F. C.**—Butterflies of chance occurrence in Cass County, Iowa, **34,** xxi, 347-8. **Lindsey, A. W.**—The butterflies of Woodbury County, Iowa, **34,** xxi, 341-46.

Bird, H.—New species and histories in Papaipema [2 new], **4,** 1915, 109-115. **Closs, A.**—Neue aberrationen aus der familie der Sphingidae, **166,** ix, 1.

DIPTERA. Aldrich, J. M.—Results of 25 years' collecting in Tachinidae with notes on some common species, **180,** viii, 79-84. **Alexander, C. P.**—The biology of the N. A. crane flies, III. The genus Ula, **189,** vii, 1-9. **Carpenter & Hewitt**—The reproductive organs and the newly hatched larva of the warble-fly (Hypoderma), **504,** xiv, 268-89. **Coutant, A. F.**—The habits, life-history, and structure of a blood-sucking muscid larva (Protocalliphora azurea), **490,** i, 134-50. **Davidson, W. M.**—Occurrence of Eumerus (Syrphidae) in California, **4,** 1915, 134-5. **H. A. B.**—A fruit fly attacking papaw fruits, **505,** xiv, 106. **Hadwen, S.**—Warble flies. A further contribution on the biology of Hypoderma lineatum and H. bovis, **394,** vii, 331-8. **Hewitt, T. R.**—The larva and pupa-

rium of the frit-fly, **504,** xiv, 313-16. **Rohrbach, P.**—Zwei ubel des eingeborenenlebens in unseren kolonien, **456,** 1915, 111-3. **Steche, O.**—Die schwimmblasen der buschelmucke, Corethra plumicornis, **66,** xii, 157-60. **Strickland, C.**—The comparative morphology of the Anophelines Nyssomyzomyia ludlowi & N. rossi, **313,** v, 321-4.

Felt, E. P.—A study of gall midges, II. [1 new genus, 3 n. sps.], **204,** Bul. 175, 79-242. **Knab, F.**—Two new sps. of Pipunculus, **161,** xxviii, 83-86. Brauer on generic values in the Muscoidea; The Nemocera not a natural group of D., **180,** viii, 91-2; 93-8. **Townsend, C. H. T.**—On proper generic conceps, **180,** viii, 85-90.

COLEOPTERA. King, I. N.—The C. of Henry County, Iowa, **34,** xxi, 317-40. **Kuhne, O.**—Der tracheenverlauf im flugel der koleopterennymphe, **97,** cxii, 692-718. **Prochnow, O.**—Das springen der schnellkaefer, physikalisch betrachtet, **81,** xxxv, 84-93.

Fall, H. C.—The west coast species of Pedilus [11 new names], **189,** vii, 10-31.

Doings of Societies.

Entomological Section, Academy of Natural Sciences of Philadelphia.

Meeting of March 25th, 1915, Mr. Philip Laurent, Director, presiding. Eight persons present. Mr. R. C. Williams was elected a member.

Lepidoptera.-Dr. Calvert communicated some observations he made in Costa Rica on the caudal brush-like appendages of the male of the butterfly *Lycorea atergatis,* exhibited specimens and drawings showing the brushes and explained the manner by which such brushes are exserted.

Diptera.—Mr. Laurent read an account from a newspaper which said that in the early days in Philadelphia the house-flies were so bad on Market or High Street that many business people left it and moved to Chestnut Street, whereby the latter became a business street.

E. T. Cresson, Jr., *Secretary pro tem.*

Feldman Collecting Social.

Meeting of March 17th, 1915, at the home of Dr. Skinner, Glenn Road, Ardmore, Pennsylvania. Eleven members and three visitors were present. President Wenzel in the chair.

Coleoptera.—Dr. Skinner exhibited pieces of board (ash) brought him by a lumber firm, part of what had been supplied for a row of dwellings, and which were riddled by *Lyctus planicollis* LeC., living specimens having been found in the pieces shown. He was told the

wood was kept in a dry kiln for ten days and subjected to a temperature of 120 to 150 degrees. He suggested that all waste should be destroyed and the lumber to be used left in a kiln for a longer period and subjected to as high a temperature as possible. Mr. Wenzel exhibited his collection of *Staphylinus* and allied genera.

Lepidoptera.—Mr. Hornig said that he had had fifty men allowed him to rid the public squares and parks of the egg masses of the tussock moth, which were very numerous this winter. Mentioned one branch about three inches in diameter and about four feet long on which he counted over two hundred egg masses. During January and February he had collected eighty-two buckets of these masses and he had figured on from three to five thousand masses to the bucket and about three hundred eggs to the mass.

Diptera.—Mr. Harbeck exhibited a pair of *Condidea lata* Coq. from White Fish Point, Michigan. Also spoke of a confusion in collections of *Laphria gilva* Linn. with allied species.

Adjourned to the annex.

GEORGE M. GREENE, *Secretary.*

OBITUARY.

CARL BRUNNER VON WATTENWYL.

Although this famous Orthopterist passed away on the twenty-fourth of August, 1914, at Kirchdorf on the Krems in Upper Austria, news of his death reached America but a few months ago, and this but a brief notice of the close of his long and active life of over ninety-one years. Brunner stands with Saussure as one of the two greatest Orthopterists of his day, as to these two men we owe practically all the groundwork and a vast proportion of the detailed study of the present classification of the order.

Brunner was born at Bern, Switzerland, June 13, 1823, a member of one of the oldest Swiss families, but early in life changed his home to Vienna, where the remainder of his life was largely spent. It seems a remarkable coincidence that the two master minds of systematic Orthopterology should both be of Swiss birth and of old Swiss families. A member of the Aulic Council and the organizer of the telegraph service of Austria, as well as a bearer of the title of "Hofrath," Brunner was a man of distinction aside from the scientific world.

In his earlier years he published a number of contributions on chemical, physical, geological, glaciological and meteorological subjects.

His first important paper on the Orthoptera appeared in 1861, entitled "Orthopterologische Studien—Beiträge zu Darwin's Theorie über die Entstehung der Arten." The first of the remarkable series of monographic studies made by him was published in 1865, "Nouveau Systeme des Blattaires," which remains the basis of the modern classification of the Blattodea. We can only call attention to the more important of his papers, these being monographic studies, which have given the present day student of the group the greater portion of his classificatory system. In addition to these large papers quite a few smaller ones appeared from his pen, the total number published by him being about twenty-seven.

In 1878, the Locustodea (Tettigoniidae of present authors) were first divided by him into families and the family Phaneropteridae monographed, followed, in 1888, by a similar treatment of the Stenopelmatidae and Gryllacridae, in 1891, by Additamenta to the Phaneropteridae and, in 1894, by a study of the Pseudophyllidae. The Acridodea received less attention from him than the katydids, the only monographic paper on that group published being his study of the Proscopidae, in 1890.

In 1882, probably his most exhaustive work appeared, the "Prodromus der Europaischen Orthopteren," which Burr has truly called an "encyclopaedia of the European forms," and which remains, after the lapse of thirty-three years, an indispensable requisite to the worker on Palaearctic Orthoptera.

The rich collections of Orthoptera made in Burma by Fea were placed in Brunner's hands for study, and in reporting on the collection he gave to the entomological world a complete "Révision du Système des Orthoptéres." This is still the basis of our classification of the order and is perhaps the most important single paper published by him. It is an indispensable necessity in the library of the general Orthopterist, although many will not agree with the treatment accorded genera of

their own region or with the character of analytic keys used. In 1906 to 1908, there appeared from the pens of Brunner and Josef Redtenbacher a monumental study entitled, "Die Insektenfamilie Phasmiden." This was the last of the great monographs from the hand of Brunner, and on it he spent years of study. The first section of it appeared when he was eighty-three years of age. In many ways it is evident in this great publication that his grip on the rapidly accumulating literature of the time was not complete, as many species and even genera, as well as much established synonymy and variational data, are ignored, the species and genera often being redescribed. This is, however, frequently the case when the preparation of a paper extends over many years, but it is regrettable that before printing or in the proof these matters were not corrected.

Several more broadly philosophical papers were published by Brunner, his "Observations on the Colours of Insects" being published in German and English in 1897. This paper attempts to classify the systems of insect coloration and is an interesting contribution to a most interesting subject. In 1883, he presented the noteworthy essay, "Ueber hypertelische Nachahmung bei den Orthopteren," in which the author advanced his theory of hypertely, a term given to phenomena not explicable in accord with the accepted theories of development.

The Brunner collection of Orthoptera at Vienna, now, we believe, in the Hofmuseum, is probably the most representative in existence, including as it does many thousands of types, of other authors as well as of Brunner himself, among these specimens being the majority of the Stål types of Phasmidae. By placing his collection at the disposal of his co-workers and in giving them aid and encouragement Brunner rendered great service to the study he loved. Redtenbacher's "Monographie der Conocephaliden," of 1891, would not have been published but for the aid of the Brunner collection.

The two criticisms which we have heard voiced and have personally felt regarding Brunner's work can, we think, be ascribed to two tendencies which are quite apparent in it. It is evident he possessed a dogmatic tendency, which is strongly

manifest in his analytic work, much of which, particularly in his "Révision" and in the "Phasmiden," is comparatively crude and unworthy of comparison with certain of his other papers—a lack of appreciation, or a disregard, of the variations of the forms before him, a tendency which sometimes completely nullified the value of pages of tables on account of the use of variable characters for major division criteria. The other tendency noticed is one which, unfortunately, was not peculiar to him. This is a disregard of the work of other authors whose papers may not be within the four walls of the study. Many of our fellow entomologists on this side of the Atlantic complain, with justice, of the lack of consideration their work has received from some of the European workers, particularly Continental students. To Americans the completion of reference files of European journals is a necessity, continuous and never ending, so the silent ignoring of their work, often based on more extensive collections and more carefully compiled data than found in Europe, is exasperating, to say the least. The author remembers quite distinctly receiving a card from Brunner asking for a certain paper, which we might add had been sent unsolicited some years before, and saying there was in Vienna no set of the journal containing it. However, the journal is now and was at that time in the two best known zoological libraries in Vienna.

Beloved by all who knew him and respected by those who appreciate the gigantic pioneer work he did in a previously little studied branch of knowledge—and this largely in the intervals of a busy official life, crowned with years over four score and ten, he passed from us. Truly may we say, "We shall never see his like again," for, owing to the enormous growth of the literature and collections, the day has passed when it was possible for one man to cover in a comprehensive fashion the ever increasing field of even a single branch of entomological knowledge.* J. A. G. R.

*For a number of the facts given above we wish to express our indebtedness to a short sketch of Brunner von Wattenwyl published by Dr. Malcolm Burr in *The Entomologist's Record and Journal of Variation*, volume XII, pages 5 and 6 (1900).

EXCHANGES.

Not Exceeding Three Lines Free to Subscribers.

☞ These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued

Wanted—50 *V. huntera*, 100 *H. unipuncta*, 25 *A. argillacea*, *Arg. diana* 2 pair, *L. eros*, *L. hulstii*, *M. eurydice* males only, *M. yuccae*, *T. gundlachianus*, *T. proterpia*, *T. nicippe*, *L. sononensis*, *T. chrysalus*, *L. ursula* 6 of each = 3 pair, 8 of any *Chrysophanus*.—A. F. Porter, Decorah, Iowa.

For Exchange—Catocala from this locality for *Catocala* and other Lepidoptera not in my collection; also fertile ova of *Catocala amatrix* and *nurus*.—Mrs. O. F. Hiser, Nevada, Iowa.

Specimens collected—Will collect Diptera, Hymenoptera, Ichneumonidae, Odonata, Hemiptera-Homoptera, Coleoptera or Lepidoptera during the coming season. Let me know your desiderata now.—Harry L. Johnson, So. Meriden, Ct.

I will name specimens of Coleoptera in certain families. Correspondence with beginners desired. No specimens will be retained without permission of the owner.—C. A. Frost, 26 Pond St., Framingham, Mass.

Wanted Transactions American Entomological Society, Vol. IV; Entomological News, Vol. II, Nos. 6 and 10, or Volume.—Howard L Clark, Hotel Puritan, Commonwealth Ave., Boston, Mass.

I have a number of duplicates of entomological Exp. Station Bulletins, Entomologist's Reports, Bureau Bulletins and Circulars, etc., for exchange or sale.—Geo. G. Ainslie, 227 Peachtree St., Nashville, Tenn.

Will exchange eggs of *Hemileuca maia* for native or exotic Lepidoptera and Coleoptera and Cicindelidae. Send your lists.—Adolph Mares, 2524 So Homan Ave., Chicago, Ill.

For Exchange—*Catocala titania* Dodge for other species of same genus not in my collection. Send list and name terms to Ernst Schwarz, 6310 N. Newstead Ave., St. Louis, Mo.

Wanted—Six dozen cocoons *Cecropia;* 500 each Ova *luna* and *polyphemus*. Lowest price.—I Rushton, 10 Carlton Road, Worksop, Notts, England.

Siphonaptera wanted.—I desire to secure specimens of fleas from various parts of the world for determination. Host records important.—F. C. Bishopp, Box 208, Dallas, Texas.

Wanted—Showy American diurnals in papers, especially Papilios in numbers. Offered British Lepidoptera and Coleoptera and British colonial stamps.—A. Ford, 36 Irving Road, Bournemouth, England.

Specimens collected—Will collect in all orders this coming season—J. Burns. 1804 Tenth St., Sacramento, Calif.

Wanted—Transactions American Entomological Society, complete set, except Vols. 1 and 2; Entomological News, Vols. 2 and 6.—Wm. S. Marshall, University of Wisconsin, Madison, Wis.

Photographs of Entomologists Desired.

The Entomological Section of the Philadelphia Academy of Natural Sciences desires for its entomological album the photograph of every entomological student. The collection contains over 300 at this date. A list was published in the NEWS 1902, pages 45-47, of those in the album at that time. We hope that those who can do so will write their names and date of birth and the date when the photograph was taken on the back of each photo, along with any other information concerning themselves they may wish to impart.

EXOTIC LEPIDOPTERA.

ERNEST SWINHOE, 6 Gunterstone Road, West Kensington, London, Eng.

Explanatory and Descriptive Catalogue, priced in American Money, 10 Cents (stamps accepted).

RECENT LITERATURE

702.—**Cresson** (E. T., Jr.).—Descriptions of new genera and species of the Dipterous family Ephydridae. II. (Ent. News, **26,** 68-72, '15) ..... .10

703.—**Rust** (E. W.).—Three new species of Aphelinus. (Ent. News, **26,** 73-77, '15) ..... .15

704.—**Weiss** (H. B.).—Additions to Insects of New Jersey. (Ent. News, **26,** 101-107, '15) ..... .15

705.—**Malloch** (J. R.).—A new species of Neogaurax (Chloropidae). (Ent. News, **26,** 108, '15) ..... .05

706.—**Ewing & Stover.**—New Parasitic Mites (Ent. News, **26,** 109-114, 1 pl., '15) ..... .20

707.—**Rehn & Hebard.**—Studies in American Tettigoniidae. IV. A Synopsis of the species of the genus Orchelimum. (**41,** 11-83, 4 pls., '15) 1.20

708.—**Alexander** (C. P.).—A second Bromeliad-inhabiting crane fly (Ent. News, **26,** 29-30, '15) ..... .05

709.—**Weiss** (H. B.).—Preliminary list of New Jersey Acarina. (Ent. News, **26,** 149-152, '15) ..... .10

710.—**Banks** (N.).—A new genus of Canestriniidae. (Ent. News, **26,** 152-153, fig., '15) ..... .05

711.—**Rau** (P.).—Duration of pupal and adult stages of the Meal Worm, Tenebrio obscurus. (Ent. News, **26,** 154-157, '15) ..... .10

712.—**Nakahara** (W.).—Three new species of Japanese Orl Flies (Ent. News, **26,** 157-160, figs., '15) ..... .10

713.—**Duran & Grinnell.**—Three Synchloes, their differences and relations. (Ent. News, **26,** 173-174, '15) ..... .05

714.—**Manee** (A. H.).—Three new species of Coleoptera from North Carolina. (Ent. News, **26,** 175-176, '15) ..... .05

715.—**Van Duzee** (E. P.).—The North American species of Draeculacephala. (Ent. News, **26,** 176-181, '15) ..... .15

716.—**Wilson** (H. F.).—Miscellaneous Aphid notes, chiefly from Oregon. (**41,** 85-108, 7 pls., '15) ..... .40

717.—**Hebard** (M.).—The genus Hygronemobius, with the description of one new species. (Ent. News, **26,** 193-199, 1 pl., '15) ..... .20

718.—**Cresson** (E. T., Jr.).—A new genus and some new species belonging to the Dipterous family Bombyliidae. (Ent. News, **26,** 200-207, fig., '15) ..... .15

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